Vegetation Resources Inventory

Air Call (Air Calibration) Data Collection Procedures and Standards

Prepared by
Ministry of Sustainable Resource Management
Terrestrial Information Branch
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Resources Information Standards Committee

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For further information about the Resources Information Standards Committee, please access the RISC website at: http://srmwww.gov.bc.ca/risc/.

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1.0 Introduction

Vegetation Resources Inventory (VRI) air calls are field assessments conducted by photo interpreters on both vegetated and non-vegetated land cover polygons. They are primarily intended to provide calibration points for subsequent photo interpretation by the individuals conducting the field visitations. Comprehensive land cover information is obtained through a detailed data-gathering routine. The data provide a useful link of land cover attributes to the polygons as observed under mid-scale aerial photography, and thus aid in providing accurate and consistent attribute estimation.

The process of air call completion also becomes an iterative educational process as photo interpreters further their knowledge of the project area. Proper location and establishment of VRI air calls provides useful data sources for any subsequent inventories.

2.0 Procedure

2.1 Principles

The following principles apply to the placement of Vegetation Resources Inventory air calls.

1. The photo interpreter is rated primarily on the final photo estimates provided. The field calibration points will be audited to assess their correct establishment.
2. Air calls are conducted in order to strengthen the final estimates.
3. All air call locations are to be referenced to a Geographic Positioning System (GPS) location so that they can be subsequently revisited if necessary.
4. All of the data collected is to be estimates. The crew making the estimates is expected to occasionally set the aircraft on the ground to enable them to collect sample data which can be used as calibration for their estimates, or to utilize other such means so that their air estimates are calibrated to known ground-measured attributes. The method used by the field crew to calibrate their estimates should be agreed to by the Contract Representative.
5. Before leaving the air call, the photo interpreter must complete all calculations and data summaries in the field.
6. Before field visitation, the photo interpreter should observe the air call through stereoscopic vision and make preliminary estimates for the attributes being collected.
7. Data collected in air calls should be for the visible portion of the polygon (trees that are visible on the aerial photographs used for the project, shrubs and herbs not otherwise obscured by taller vegetation, etc.) For the tree data, this would normally include trees in the dominant, co-dominant and high intermediate canopy positions. This collected information can be correlated with what is visible to the photo interpreter on the photograph.
8. For multi-layer stands, compete information is to be collected and recorded for each layer visible from the aircraft and on the aerial photograph. The field crew should stereoscopically view the polygon prior to collecting any data to determine whether multiple tree layers exist within the polygon.
9. A minimum of one British Columbia Vegetation Resources Inventory Certified Photo Interpreter must be in the aircraft during the collection of the data.

The collection of field calibration data should be distributed to cover the full range of anticipated land cover types to be observed. A tally should be kept for this purpose, and particularly complex cover types should be given emphasis for measurement. In this respect, initial polygon delineation for a project should be completed prior to the determination of field calibration locations. Priorities for data collection may be identified on a project-by-project basis.

2.2 Field Work

Once all preliminary planning (polygon delineation, pre-designation of field calibration locations, access issues, permission acquired if entering private land / parks, all equipment assembled, etc.) has been completed, field data collection can begin.

Air calls should be flown in such a way that they cover as much of the polygon as is reasonably possible. Variability within the stand should be accounted for in the final label that is attached to the calibration point. All information collected should be recorded on the Vegetation Resources Inventory Air Call Form.

2.3 Field Form

2.3.1 Header Information

The information at the top of the Air Call Form is to be completed for each page used in the collection of air call information. This information is to be used as a reference for both present and future projects.

2.3.2 General Data

Air Call Number

Assign each air call a unique air call number. Air calls are to be numeric only, and should be numbered systematically for ease of reference.

Photo Number

Record the aerial photograph that was used by the field crew to establish the air call in the vegetation inventory polygon. As the new delineation is completed on the even-numbered photograph, the field crew should record the appropriate information on the face of the odd-numbered photograph and reference the odd-numbered photograph on the Air Call Form.

Elevation

Recording of the elevation is optional and at the discretion of the field crew. This data may be useful to the photo interpreter in that species occurrence ranges by elevation (both minimums and maximums) could be correlated from the collected data.

Map Sheet Number

Eight character spaces have been provided to record the map sheet number that the air call was located in. The first seven characters are for standard British Columbia Geographic System (BCGS) numbering, with an additional space provided for map sheet quad should this space be needed. For projects on Crown land, only the first seven character spaces are to be used.

Ecology

The collection of ecological information is optional and at the discretion of the field crew, as this data may be better estimated from the aerial photograph. Identification of unique information more readily visible from the aircraft should be noted on the field card. Information for which space is not provided on the field card should be recorded in the comments section.

2.3.3 Tree Specific Data

Treed polygons should have the following polygon attributes estimated for each tree layer present within the polygon.

Tree Layer

This attribute identifies the tree layer that is being described in a multi-layered stand. Each layer is distinguished according to recognized height differences, historical features and other criteria as described in the VRI Photo Interpretation Procedures. The layer of greatest height is indicated by number '1', with each subsequently shorter layer being identified with sequentially larger numbers (for example, the next tallest layer would be '2', the next tallest '3' etc.)

Vertical Complexity

The tree vertical complexity describes the form of the tree layer as indicated by the relative uniformity of the main forest canopy. Each of the categories indicates the relative variation in the range of tree height in the layer.

Species Composition

The tree species composition is determined on the basis of basal area and can include a maximum of six tree species. Each species indicated must have a corresponding percentage included. Where multiple species within the same genus are present in the polygon, the field crew should make every effort to distinguish and record the percent composition of each species. In cases where it is not possible to distinguish down to the species level (such as hybrid hemlock), only the genus should be recorded on the field form. Information related to the species composition of the polygon not already captured on the form can be entered in the comments section.

Age

The age of the first and second (if present) species are to be estimated to the nearest year when possible or to the nearest ten years when practical. Age is to be estimated for those trees in the dominant, co-dominant and high intermediate crown positions. If a range of ages is present in the polygon, this should be indicated in the comments section of the Air Call Form.

Height

The height of the first and second (if present) species are to be estimated to the nearest metre in all cases. Height is to be estimated for those trees in the dominant, co-dominant and high intermediate crown positions. If a range of heights is present in the polygon, this should be indicated in the comments section of the Air Call Form.

2.3.4 Non-Tree Data

Data for the non-tree (shrub, herb and non-vegetated) attributes should be collected when these features are distinguishable both from the aircraft and on the photograph.

Non-tree data should only be recorded on the Air Call Form when these features are not otherwise obscured under the vertical projection of any taller vegetation (they are visible on the aerial photograph).

Shrub Height

The shrub height is the average height, in tenths of a metre, weighted by crown closure, of all shrubs visible within the polygon both from the aircraft and on the aerial photograph. A critical threshold value is an average shrub height of 2.0 metres, as this indicates a significant feature for wildlife management.

Herb Cover Type

The herb cover type provides for differentiation of three herbaceous features that are described in the VRI Photo Interpretation Procedures. If it is not possible to distinguish the specific type of herbaceous cover present in the polygon, the indistinguishable herbaceous cover code ('HE') should be used.

Non-Vegetated Cover Type

The non-vegetated cover type allows for the designation and description of all observable non-vegetated land cover within the polygon. The two-letter codes are described in the VRI Photo Interpretation Procedures. If more than one non-vegetated cover type is present within the polygon, each cover type should be indicated on the Air Call Form on a separate row of the form. Additional information related to the polygon not already captured on the form can be entered in the comments section.

2.4 Transfer to the Photograph

Upon completion of the air call, enter on the reverse (back) side of the appropriate aerial photograph the specific details of the air call, including the collected tree data.

Because of the comprehensive nature of the data collected in the VRI, in general only the air call location and extent, the air call number and the year of the survey can be entered on the face of the air photo. These requirements may vary on a project-by-project basis.

3.0 Air Observations

Air observations can be an integral and highly useful source of data for the photo interpreter. Efforts should be made to collect and record data while traveling between formal air calibration locations.

Air observations are situations where selected polygon attributes are estimated from the aircraft without an extensive amount of time being spent confirming the remaining polygon attributes. Because of the nature of the estimates, data collection is normally restricted to the identification of significant tree species (with or without a complete species composition), or the identification and differentiation of non-treed attributes. For the non-treed component, this can included differentiating the height of shrubs (shrub tall from shrub low), graminoids from forbs or indicating the specific type of non-vegetated cover.

Documentation on the face of the aerial photograph should include the air observation location, the year of observation and any information collected. These requirements may vary on a project-by-project basis. This information is usually only recorded directly on the face of the photograph.

Appendix 1: Air Call Standards and Ratings

The purpose of the air call quality assurance and auditing process is to facilitate the payment of funds for contract administration purposes. Acceptance of the air call data is not necessarily a reflection of the accuracy of the data as the data may be within the defined standard but still have a biased result.

Standards:

Species Composition:	At least 80% of species composition must be correctly identified.
Leading Species:	The leading species must be correctly identified. If the first and second species are within 10% by composition, then either species is acceptable as the leading species.
Age:	For polygons with an estimated age less than or equal to 30 years, the age estimate must be within ± 5 years. For polygons with an estimated age greater than 30 years, the age estimate must be within ± 20% or 15 years, whichever is greater.
Height:	The height estimate must be within ± 15% or 3 metres, whichever is greater.

Rating:

Species Composition:	≥80% correct –	7 points
	≥70% correct –	4 points
	< 70% correct –	0 points
Correct Leading Species:	4 points	
Leading Species Age:	4 points*	
Second Species Age:	2 points*	
Leading Species Height:	5 points*	
Second Species Height:	3 points*	

*If the species composition is at least 80% correct, then the same species will be used for the comparison for ages and heights. If species composition is less than 80% correct, the leading and second species ages and heights will be compared regardless of species.

Example:

Auditor	Contractor	
$S_{40}Pl_{30}Bl_{30}$	$Bl_{40}S_{30}Pl_{30}$	Species composition correct = 90%; Compare S to S as leading species; no compatible second species to compare.
$Fd_{50}S_{40}Pl_{10}$	$S_{50}Fd_{40}Pl_{10}$	Species composition correct = 90%; Compare Fd to Fd as leading species; S to S as second species
$Pl_{60}Fd_{30}Lw_{10}$	$Fd_{55}Lw_{20}Pl_{20}$	Species composition correct = 60%; Compare Pl to Fd as leading species; Fd to Lw as second species

Accept / Reject Criteria:

The minimum acceptable rating on any individual air call is 70%. Any air call not meeting this minimum percentage will be rejected. Each category must also achieve an overall rating of 70% to be considered acceptable. Any category that does not achieve this minimum standard will be rejected for that category. The minimum acceptable standard for all air calls audited is 85%. If the average score of all of the audited air calls, as determined from the summary form, meets this minimum acceptance level, and the two other standards are achieved, the work is considered acceptable.

Vegetation Resources Inventory
Air Call Point Rating Summary Form

Project: _____ **Contractor:** _____

Number of Air Calls Completed:_____ Number of Air Calls Audited: _____

Air Call Number	Flight Line	Photo Number	Species Comp (7)	Leading Species (4)	Leading Age (4)	Leading Height (5)	Second Age (2)	Second Height (3)	Points Possible	Points Obtained	Percent	Remarks
Points Obtained												
Points Possible												
Rating (%)												

_____ / _____ x 100 = Overall Rating _____%
(Total Points Obtained)(Total Points Possible)

Interpreter: _____ Auditor: _____

Date: _____ Accept: _____
(Yes/No)

Accept/Reject Criteria:

The minimum acceptable rating on any individual air call is 70%. Any air call not meeting this minimum percentage will be rejected. Each category must also achieve an overall rating of 70% to be considered acceptable. Any category that does not achieve this minimum standard will be rejected for that category. The minimum acceptable standard for all air calls audited is 85%. If the average score of all of the audited air calls, as determined from the summary form, meets this minimum acceptance level, and the two other standards are achieved, the work is considered acceptable.